

BIOGRAPHICAL SKETCH

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(a) Professional Training

Undergraduate Institution: Northwestern University, Evanston, Illinois,
B.A. Biology 1978

Graduate Institution: University of California, Berkeley, California
M.Sc. Plant Pathology 1982
Ph.D. Plant Pathology 1993

(b) Appointments:

2012 – Present Adjunct Professor, Department of Environmental Science, Policy, and Management, University of California, Berkeley, CA

2011 – Present Senior Scientist, Ecology Department Head, Earth Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA

2003-2011 Staff Scientist and Group Leader, Molecular and Microbial Ecology, Earth Sciences, Lawrence Berkeley National Laboratory, Berkeley, CA

1997-2002 Sr. Biomedical Scientist, Biology & Biotechnology Res. Prog., Lawrence Livermore National Laboratory, Livermore, CA

1993-1996 Postdoctoral Fellow, Department of Infectious Diseases, Duke University Medical School, Durham, NC

(c) Peer-Reviewed Publications (h-index 40):

1. Krebs, J. E., Vaishampayan, P., Probst, A. J., Tom, L. M., Marteinsson, V. T., Andersen, G. L., Venkateswaran, K. (2014) Microbial Community Structures of Novel Icelandic Hot Spring Systems Revealed by PhyloChip G3 Analysis. *Astrobiology*. 2014 Mar 3. [Epub ahead of print] PMID: 24588539
2. Wells, G. F., Wu, C. H., Piceno, Y. M., Eggleston, B., Brodie, E. L., Desantis, T. Z., Andersen, G. L., Hazen, T. C., Francis, C. A., Criddle, C. S. (2014) Microbial biogeography across a full-scale wastewater treatment plant transect: evidence for immigration between coupled processes. *Appl Microbiol Biotechnol*. 2014 Feb 20. [Epub ahead of print] PMID: 24553968
3. Ceja-Navarro, J. A., Nguyen, N. H., Karaoz, U., Gross, S. R., Herman, D. J., Andersen, G. L., Bruns, T. D., Pett-Ridge, J., Blackwell, M., Brodie, E. L. (2014) Compartmentalized microbial composition, oxygen gradients and nitrogen fixation in the gut of *Odontotaenius disjunctus*. *ISME J.* **8**:6-18. PMID: 23985746
4. Kellogg, C. A., Piceno, Y. M., Tom, L. M., DeSantis, T. Z., Gray, M. A., Zawada, D. G., Andersen, G. L. (2013) Comparing bacterial community composition between healthy and White Plague-Like disease states in *Orbicella annularis* using PhyloChip™ G3 microarrays. *PLoS One*. **8**:e79801 PMID: 24278181
5. Dubinsky, E. A., Conrad, M. E., Chakraborty, R., Bill, M., Borglin, S. E., Hollibaugh, J. T., Mason, O. U., Piceno, Y., Reid, F. C., Stringfellow, W. T., Tom, L. M., Hazen, T. C., Andersen, G. L. (2013) Succession of Hydrocarbon-Degrading Bacteria in the Aftermath of the Deepwater Horizon Oil Spill in the Gulf of Mexico. *Environ. Sci. Technol.* **47**:10860-10867 PMID: 23937111

6. Cao, Y., Van De Werfhorst, L. C., Dubinsky, E. A., Badgley, B. D., Sadowsky, M. J., Andersen, G. L., Griffith, J. F., Holden, P. A. (2013) Evaluation of molecular community analysis methods for discerning fecal sources and human waste. *Water Res.* **47**:6862-72. PMID: 23880215
7. Zhang, R., Wu, Q., Piceno, Y. M., DeSantis, T. Z., Saunders, F. M., Andersen, G. L., Liu, W. T. (2013) Diversity of bacterioplankton in contrasting Tibetan lakes revealed by high-density microarray and clone library analysis. *FEMS Microbiol Ecol.* **86**:277-87 PMID: 23837564
8. Ding, G. C., Piceno, Y. M., Heuer, H., Weinert, N., Dohrmann, A. B., Carrillo, A., Andersen, G. L., Castellanos, T., Tebbe, C. C., Smalla, K. (2013) Changes of soil bacterial diversity as a consequence of agricultural land use in a semi-arid ecosystem. *PLoS One.* **8**:e59497 PMID: 23527207
9. Closek, C. J., Sunagawa, S., Desalvo, M. K., Piceno, Y. M., DeSantis, T. Z., Brodie, E. L., Voolstra, C. R., Andersen, G. L., Medina, M. (2013) How Bacteria and Genes Reflect the Health States of Corals. *Integrative and Comparative Biology* **53**: Supplement 1, E267.
10. Mello, A., Ding, G. C., Piceno, Y. M., Napoli, C., Tom, L. M., DeSantis, T. Z., Andersen, G. L., Smalla, K., Bonfante, P. (2013) Truffle brûlés have an impact on the diversity of soil bacterial communities. *PLoS One.* **8**: e61945. PMID: 23667413
11. Probst, A. J., Holman, H. Y., DeSantis, T. Z., Andersen, G. L., Birarda, G., Bechtel, H. A., Piceno, Y. M., Sonnleitner, M., Venkateswaran, K., Moissl-Eichinger, C. (2013) Tackling the minority: sulfate-reducing bacteria in an archaea-dominated subsurface biofilm. *ISME J.* **7**: 635-51. PMID: 23178669
12. Korves, T. M., Piceno, Y. M., Tom, L. M., DeSantis, T. Z., Jones, B. W., Andersen, G. L., Hwang, G. M. (2013) Bacterial communities in commercial aircraft high-efficiency particulate air (HEPA) filters assessed by PhyloChip analysis. *Indoor Air.* **23**:50-61 PMID: 22563927
13. Lau, S. C., Zhang, R., Brodie, E. L., Piceno, Y. M., Andersen, G., Liu, W. T. (2013) Biogeography of bacterioplankton in the tropical seawaters of Singapore. *FEMS Microbiol Ecol.* **84**:259-69 PMID: 23237658
14. Chakraborty R, Borglin SE, Dubinsky EA, Andersen GL, Hazen TC. (2012) Microbial response to the MC-252 oil and Corexit 9500 in the Gulf of Mexico. *Front Microbiol.* **3**:357. PMID:23087678
15. Vaishampayan, P., Probst, A. J., La Duc, M. T., Bargoma, E., Benardini, J. N., Andersen, G. L., Venkateswaran, K. (2012) New perspectives on viable microbial communities in low-biomass cleanroom environments. *ISME J.* **7**: 312-24. PMID:23051695
16. Hayden, H. L., Mele, P. M., Bougoure, D. S., Allan, C. Y., Norng, S., Piceno, Y. M., Brodie, E. L., DeSantis, T. Z., Andersen, G. L., Williams, A. L., Hovenden, M. J. (2012) Changes in the microbial community structure of bacteria, archaea and fungi in response to elevated CO₂ and warming in an Australian native grassland soil. *Environ Microbiol.* **14**:3081-96. PMID: 23039205
17. Hwang, C., Ling, F., Andersen, G. L., LeChevallier, M. W., Liu, W. T. (2012) Microbial community dynamics of an urban drinking water distribution system subjected to phases of chloramination and chlorination treatments. *Appl Environ Microbiol.* **78**:7856-65. PMID: 22941076
18. Vaziri, N. D., Wong, J., Pahl, M., Piceno, Y. M., Yuan, J., DeSantis, T. Z., Ni, Z., Nguyen, T. H., and G. L. Andersen (2012) Chronic kidney disease alters intestinal microbial flora. *Kidney Int.* **83**:308-15. PMID: 22992469
19. Cruz-Martínez K, Rosling A, Zhang Y, Song M, Andersen GL, Banfield JF. (2012) Effect of rainfall-induced soil geochemistry dynamics on grassland soil microbial communities. *Appl Environ Microbiol.* **78**:7587-95 PMID: 22904056
20. Sercu B, Jones AD, Wu CH, Escobar MH, Serlin CL, Knapp TA, Andersen GL, Holden PA. (2012) The Influence of In Situ Chemical Oxidation on Microbial Community Composition in Groundwater Contaminated with Chlorinated Solvents. *Microbiol Ecol.* **65**:39-49 PMID: 22864851
21. Beazley MJ, Martinez RJ, Rajan S, Powell J, Piceno YM, Tom LM, Andersen GL, Hazen TC, Van Nostrand JD, Zhou J, Mortazavi B, Sobecky PA. (2012) Microbial community analysis of a

- coastal salt marsh affected by the deepwater horizon oil spill. *PLoS One.* **7**:e41305 PMID: 22815990
22. Tang, X., Freitak, D., Vogel, H., Ping, L., Shao, Y., Cordero, E. A., Andersen, G., Westermann, M., Heckel, D. G., Boland, W. (2012) Complexity and variability of gut commensal microbiota in polyphagous lepidopteran larvae. *PLoS One.* **7**:e36978. PMID: 22815679
23. Human Microbiome Consortium. (2012) A framework for human microbiome research. *Nature* **486**:215-221. PMID: 22699610
24. Human Microbiome Consortium. (2012) Structure, function and diversity of the healthy human microbiome. *Nature* **486**:207-214. PMID: 22699609
25. Reith, F., Brugger, J., Zammit, C. M., Gregg, A. L., Goldfarb, K. C., Andersen, G. L., DeSantis, T. Z., Piceno, Y. M., Brodie, E. L., Lu, Z., He, Z., Zhou, J., Wakelin, S. A. (2012) Influence of geogenic factors on microbial communities in metallogenic Australian soils. *ISME J.* **6**:2107-18 PMID: 22673626
26. Lam, V., J. E. Moulder, N. H. Salzman, E. A. Dubinsky, G. L. Andersen, J. E. Baker. (2012) Intestinal Microbiota as Novel Biomarkers of Prior Radiation Exposure. *Radiation Research* **177**: 573-583. PMID: 22439602
27. Handley, K. M., Wrighton, K. C., Piceno, Y. M., Andersen, G. L., DeSantis, T. Z., Williams, K. H., Wilkins, M. J., N'guessan, A. L., Peacock, A., Bargar, J., Long, P. E., Banfield, J.F. (2012) High-density PhyloChip profiling of stimulated aquifer microbial communities reveals a complex response to acetate amendment. *FEMS Microbiol Ecol.* **8**:188-204. PMID: 22432531
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29. Lee, P. K., Dill, B. D., Louie ,T. S., Shah, M., Verberkmoes, N. C., Andersen, G. L., Zinder, S. H., Alvarez-Cohen, L. (2012) Global Transcriptomic and Proteomic Responses of Dehalococcoides ethenogenes Strain 195 to Fixed Nitrogen Limitation. *Appl Environ Microbiol.* **78**:1424-1436. PMID: 22179257
30. McDonald, D., Price, M. N., Goodrich, J., Nawrocki, E. P., DeSantis, T. Z., Probst, A., Andersen, G. L., Knight, R., Hugenholz, P. (2012) An improved Greengenes taxonomy with explicit ranks for ecological and evolutionary analyses of bacteria and archaea. *ISME J.* **6**:610-618. PMID: 22134646
31. He, Z., Piceno, Y., Deng, Y., Xu, M., Lu, Z., DeSantis, T., Andersen, G., Hobbie, S. E., Reich, P. B., Zhou J. (2012) The phylogenetic composition and structure of soil microbial communities shifts in response to elevated carbon dioxide. *ISME J.* **6**:259-27. PMID: 21796217
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34. Lee, P. K., Warnecke, F., Brodie, E. L., Macbeth, T. W., Conrad, M. E., Andersen, G. L., Alvarez-Cohen, L. (2012) Phylogenetic Microarray Analysis of a Microbial Community Performing Reductive Dechlorination at a TCE-Contaminated Site. *Environ Sci Technol.* **46**:1044-54. PMID: 22091783
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37. Hwang, C., Ling, F., Andersen, G. L., Lechevallier, M. W., Liu, W. T. (2011) Evaluation of Methods for the Extraction of DNA from Drinking Water Distribution System Biofilms. *Microbes Environ.* **27**:9-18 PMID:22075624
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39. DeAngelis, K. M., Wu, C. H., Beller, H. R., Brodie, E. L., Chakraborty, R., DeSantis, T. Z., Fortney, J. L., Hazen, T. C., Osman, S. R., Singer, M. E., Tom, L. M., Andersen, G. L. (2011) PCR amplification-independent methods for detection of microbial communities by the high-density microarray PhyloChip. *Appl. Environ. Microbiol.* **77**:6313-6322 PMID: 21764955
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41. Banning NC, Gleeson DB, Grigg AH, Grant CD, Andersen GL, Brodie EL, Murphy DV. 2011. Soil microbial community successional patterns during forest ecosystem restoration. *Appl Environ Microbiol.* **77**:6158-6164. PMID: 21724890
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44. Kelly, L. C., Cockell, C. S., Herrera-Belaroussi, A., Piceno, Y., Andersen, G., DeSantis, T., Brodie, E., Thorsteinsson, T., Marteinsson, V., Poly, F., Leroux, X. (2011) Bacterial diversity of terrestrial crystalline volcanic rocks, Iceland. *Microb. Ecol.* **62**:69-79 2011. PMID 21584756
45. DeSantis, T. Z., Keller, K., Karaoz, U., Alekseyenko, A. V., Singh, N. N., Brodie, E. L., Pei, Z., Andersen, G. L., Larsen, N.(2011) Simrank: Rapid and sensitive general-purpose k-mer search tool. *BMC Ecol.* **11**:11. PMID: 21524302
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- evidence of gene transfer in hypersaline microbial communities. *PLoS One.* 2010 **5**:e12919. PMID: 20957119
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53. Vaishampayan, P., Osman, S., Andersen, G., and Venkateswaran, K. (2010) High-density 16S microarray and clone library-based microbial community composition of the phoenix spacecraft assembly clean room. *Astrobiology* **10**:499-508. PMID: 20624058
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(d) Book chapters:

1. **Andersen, G. L.**, He. Z., DeSantis, T. Z., Brodie, E. L., and Zhou, J. (2010) The Use of Microarrays in Microbial Ecology, pp 87-110. In Liu, W.T. and Jansson J. K. (ed), *Environmental Molecular Microbiology*. Caister Academic Press (January, 2010). ISBN 978-1-904455-52-3
2. **Andersen, G. L.**, Frisch, A.S., Kellogg, C.A., Levetin, E., Lighthart, B., Paterno, D. (2009) Aeromicrobiology/Air Quality. In Schaechter, M (editor-in-chief) *Encyclopedia of Microbiology, Third Edition*. Academic Press (May 15, 2009). ISBN 978-0-12-373939-1
3. Brodie, E. L., DeSantis, T.Z., Piceno, Y. M. and **Andersen, G. L.** (2009) High density DNA microarray analysis for monitoring microbial community composition and dynamics. In Kowalchuck, G.A. (ed), *Molecular Microbial Ecology Manual*. Kluwer Academic Publishers. (In press.)
4. **Andersen, G.L.**, Piceno, Y. M., DeSantis, T. Z. and Brodie, E. L. (2006) What DNA Microarrays Can Tell Us About Bacterial Diversity: A New Light on an Old Question. In Bailey, M.J. (ed), *Microbial Ecology of Aerial Plant Surfaces* Oxford University Press, pp. 251-267. ISBN 978-1845930-61-5

(e) Research interests and experience:

I am interested in using molecular approaches to study the dynamics of microbial community structure in the environment. This includes the development of new techniques to dissect the microbial diversity of complex ecosystems. The long-term goal of this research is to integrate different fields of biology (i.e., genomics, ecology, molecular biology, proteomics and bioinformatics) to provide insight into the interactions of environmental microorganisms under stressful conditions. My current research focuses on the microbial ecology of airborne and aquatic bacteria with an emphasis on the natural distribution of pathogens in the environment. I have developed numerous microarray systems for the measurement of microbial diversity and the identification of bacterial communities by 16S and other gene sequences. I have also used microarrays for whole genome expression of genes in response to environmental stimuli.

(f) Professional Service and Activities:

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| 1999- | Ad hoc reviewer for the following journals; PNAS, Nature Biotechnology, FEMS Microbiology Ecology, FEMS Microbiology Letters, Environmental Microbiology, Anaerobe, Journal of Bacteriology, Journal of Clinical Microbiology, Microbial Ecology, Atmospheric Chemistry and Physics. |
| 2000-2003 | Member, Joint DOE-DTRA Task Force on Microbial Backgrounds. Washington D.C. |
| 2001- | Science Advisor to the Einstein Institute for Science, Health & the Courts (EINSHAC), Washington, D.C. |
| 2001-2003 | Advisory Committee for Air Force Technical Applications Center, Patrick AFB, FL |
| 2003-2004 | Member, LBNL Institutional Biosafety Committee. |
| 2004- | Editorial Board of Applied and Environmental Microbiology |
| 2006- | Genomic Aerobiology Working Group, Alfred P. Sloan Foundation. |
| 2008- | Co-founder and member of Scientific Advisory Board, Second Genome Inc. |
| 2009- | Alfred P. Sloan Foundation Scientific Advisory Board Microbiology of the Built Environment. |
| 2010- | Editorial Board of ISME Journal. |
| 2011- | Head, LBNL Institutional Biosafety Committee. |

(g) Honors:

- | | |
|------|----------------------------------------------------------------------------|
| 1993 | Teaching Effectiveness Award. University of California, Berkeley, CA, 1993 |
| 2000 | NAI Directorate Award, LLNL, Livermore, CA. |
| 2002 | Directors Award, LLNL, Livermore, CA. |

- 2008 R&D 100 Award for Berkeley PhyloChip.
- 2008 Overall Bronze Medal winner, and Environment category winner, Wall Street Journal Technology Innovation Awards.
- 2012 Directors Award for Exceptional Achievement, Lawrence Berkeley Lab.

(h) Research Supervision:

Graduate Students - Ph.D. Committee Member for Mareike Viebahn, Utrecht University, Shini Sunagawa, UC Merced, Collin Closek, UC Merced, Rebecca Daly, UC Berkeley, and Pei-Ying Hong, National University of Singapore.

Post Doctoral Scientists (completed) – Lyndsay Radnedge, Peter Agron, Eoin Brodie, Stéphanie Bernard (Swarbreck), Cindy Wu, Kristen DeAngelis.

Post Doctoral Scientists (current) Eric Dubinsky.

(j) Patents:

Array for Detecting Microbes. PCT/US2007/024720.

Heavy Metal Biosensor. JIB-2368PCT

Improved Method for Phylogenetic Microarray Design and Analysis. IB-2733).

Nucleotide Sequences Specific to *Bacillus anthracis*. Number 7,494,778.